

REMARKS

Claims 4-6, 13-17, 30, 31 and 33-43 are pending in the application.

Claims 30, 31, 33, 38 and 40-43 have been rejected.

Claims 4-6, 13-17, 34-37 and 39 have been objected to.

Claims 38 and 40 have been amended as set forth herein.

Claims 4-6, 13-17, 30, 31 and 33-43 remain pending in this application.

Reconsideration of the claims is respectfully requested. The Applicants make the aforementioned amendments and subsequent arguments to place this application in condition for allowance. Alternatively, the Applicants make these amendments and offer these arguments to properly frame the issues for appeal. In this Response, the Applicants make no admission concerning any now moot rejection or objection, and affirmatively deny any position, statement or averment of the Examiner that was not specifically addressed herein.

I. ALLOWABLE SUBJECT MATTER

The Examiner objected to Claims 4-6, 13-17, 34-37 and 39 as being dependent upon a rejected base claim, but suggested that Claims 4-6, 13-17, 34-37 and 39 would be allowable if it were rewritten in independent form including all the limitations of the base and intervening claims. Applicants thank the Examiner for this suggestion but elect not to rewrite Claims 4-6, 13-17, 34-37 and 39 at this time.

II. **CLAIM REJECTIONS -- 35 U.S.C. § 103**

Claim 33 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 7,424,121 to Kubota (“*Kubota*”) and U.S. Patent No. 6,449,368 to Davis, et al (“*Davis*”). The Applicants respectfully traverse the rejection.

Claim 38 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Kubota* and U.S. Patent No. 7,242,782 to Kasai, et al (“*Kasai*”). The Applicants respectfully traverse the rejection.

Claims 40-41 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,388,494 to Schöne, et al (“*Schöne*”). The Applicants respectfully traverse the rejection.

Claim 43 was rejected under 35 U.S.C. § 103(a) as being unpatentable over *Schöne* and U.S. Patent No. 7,382,885 to Kim, et al (“*Kim*”). The Applicants respectfully traverse the rejection.

Claims 42, 30 and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Schöne* and *Kasai*. The Applicants respectfully traverse the rejection.

In *ex parte* examination of patent applications, the Patent Office bears the burden of establishing a *prima facie* case of obviousness. MPEP § 2142; *In re Fritch*, 972 F.2d 1260, 1262, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992). The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention is always upon the Patent Office. MPEP § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984). Only when a *prima facie* case of obviousness is established does the burden shift to the applicant to produce evidence of nonobviousness. MPEP §

2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). If the Patent Office does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to grant of a patent. *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Grabiak*, 769 F.2d 729, 733, 226 U.S.P.Q. 870, 873 (Fed. Cir. 1985).

A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art. *In re Bell*, 991 F.2d 781, 783, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed invention and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. MPEP § 2142. In making a rejection, the examiner is expected to make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), *viz.*, (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the art. In addition to these factual determinations, the examiner must also provide "some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." (*In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed.

Cir 2006) (cited with approval in *KSR Int'l v. Teleflex Inc.*, 127 S. Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007)).

Independent Claim 33 recites an audio processor that includes “a virtualizer configured to process audio information to virtualize at least one speaker such that, from a listener’s perspective, sounds appear to come from at least one direction where a physical speaker is not present, the virtualizer comprising a first feedback crossover path configured to receive, delay, and filter signals output from the virtualizer.”

The Office Action maintains that the combination of *Kubota* and *Davis* teaches the aforementioned features of Claim 33. The Office Action concedes that *Kubota* fails to teach the virtualizer comprising a first feedback crossover path configured to receive, delay and filter signals output from the virtualizer. (*Office Action*, pages 4 and 7). Nonetheless, the Office Action rejects independent Claim 33 contending that *Davis* provides this necessary disclosure. The Office Action states that “it would have been obvious for one of ordinary skill in the art to have modified the combination with incorporating the first feedback crossover path configured to receive, delay, and filter signals output from the virtualizer so as to create phantom or virtual images-sound apparently come from directions of the original channel.”

The Office Action however, has impermissibly used the instant claims as a guide or roadmap for forming the rejection. *Kubota* already provides for virtual acoustic image localization. The Office Action expressly states that *Kubota* teaches an “audio processor being configurable to virtualize the at least one speaker location at any location in a space around the listener.” (*Office*

Action, page 7). Therefore, the Office Action expressly identifies that *Kubota* has solved the problem to create phantom or virtual sound from a direction other than the original channel position. As stated by the BPAI in *Ex Parte Rinkevich et al.* (BPAI 2007-1317, non-precedential), a skilled person would not look to a second patent to solve a problem already solved by a first patent (and by the patentee).¹ A person of ordinary skill in the art having common sense at the time of the invention would not have reasonably looked to *Davis* to solve a problem already solved by *Kubota*.

Accordingly, the Applicants respectfully request that the § 103 rejection with respect to Claim 33, and its dependent claims, be withdrawn.

Currently amended independent Claim 38 recites a device that includes:

an audio source operable to provide audio information; and
an audio processor operable to receive the audio information and process the audio information to virtualize at least one speaker so that, from a listener's perspective, sounds appear to come from at least one direction where a physical speaker is not present, the audio processor being configurable to virtualize the at least one speaker at any location in a space around the listener; and
wherein the audio processor comprises:
a virtualizer configured to process audio information to virtualize the at least one speaker;
a controller configured to determine a location of the at least one speaker based on a number of parameters including at least a position of at least one actual speaker and configured to cause the virtualizer to virtualize the at least one speaker at the determined location by individually altering a frequency response of one or more of the filters and a delay of one or more of the delay lines.

¹ In *Ex Parte Rinkevich et al.* (BPAI 2007-1317, non-precedential), the BPAI applies KSR to reason that a skilled person would not look to a second patent to solve a problem already solved by a first patent (and by the patentee). The BPAI wrote that in "the instant case, we conclude that a person of ordinary skill in the art having common sense at the time of the invention would not have reasonably looked to Wu to solve a problem already solved by Savill. Therefore, we agree with Appellants that the Examiner has impermissibly used the instant claims as a guide or roadmap in formulating the rejection."

The Applicants respectfully submit that *Kubota* and *Kasai*, alone or in combination, do not teach or suggest the aforementioned features of Claim 38. In particular, it is submitted that the asserted combination does not teach or suggest “a controller configured to determine a location of the at least one speaker based on a number of parameters including at least a position of at least one actual speaker and configured to cause the virtualizer to virtualize the at least one speaker at the determined location by individually altering a frequency response of one or more of the filters and a delay of one or more of the delay lines.

Kubota relates to an audio processing apparatus that performs virtual acoustic image localization processing for sound source signals. (*Kubota*, Abstract). *Kubota* teaches that virtual acoustic image localization is accomplished by performing appropriate filter processing of monaural audio signals based on the transfer functions from the position at which the acoustic image is to be localized to both the listener's ears (HRTF: Head Related Transfer Function) and the transfer functions from a pair of speakers placed in front of the listener to both the listener's ears, the acoustic image can also be localized in places other than the positions of the pair of speakers, for example, behind or to one side of the listener. (*Kubota*, col. 1, lines 31-42).

Kasai relates to an audio processing circuit. (*Kasai*, Abstract). *Kasai* teaches that, Finite Impulse Response (FIR) filters are employed for crosstalk-cancelling. (*Kasai*, col. 11, line 59-col. 12, line27). *Kasai* expressly teaches that the FIR filters are “set” to specified values (e.g., a first filter set to 128 taps and the second filter set to 32 taps) to improve accuracy in the low frequency component. (*Kasai*, col. 12, lines 23-58). However, *Kasai* does not teach or suggest that the delays

are individually altered. Rather, *Kasai* expressly states that the delays “set.” *Kasai* does not teach that a delay of one or more of the delay lines is altered. The cited portion of *Kasai* states:

Delay means 205, 206 and 208 perform delay processing which compensates a time required for the processing performed by the filter bank. The delay means 205 performs delay processing in an amount of three sampling data, the delay means 206 performs delay processing in an amount of one sampling data, and the delay means 208 performs delay processing in an amount of seven sampling data.

According to this embodiment employing the filter bank, a cross-talk cancel filter having a high ability of 128 taps can be obtained while the total tap number of the FIR filters 201, 202, 203 and 204 is kept 68 taps. (*Kasai*, col. 12, lines 36-47).

As shown here, *Kasai* only teaches that delay means 205, 206 and 208 exist and perform delay processing of data. *Kasai* does not teach that a delay in one or more of the delay means is altered by the controller. In contrast, Claim 38 recites that the controller is configured to cause the virtualizer to virtualize the at least one speaker at the determined location by individually altering a frequency response of one or more of the filters and a delay of one or more of the delay lines. Therefore, *Kasai* does not provide a disclosure that remedies the conceded deficiency of *Kubota*.

Further, neither *Kubota* nor *Kasai*, teaches or suggest that the controller is configured to determine a location of the at least one speaker based on a number of parameters including at least a position of at least one actual speaker. Neither *Kubota* nor *Kasai*, teaches that a controller is configured to determine a location of the virtualized speaker based on a location of an actual speaker. In addition, neither *Kubota* nor *Kasai*, teaches that after making a determination of the location for the virtualized speaker, the controller is configured to individually alter the frequency response of one or more filters and delay of one or more delay lines.

Accordingly, the Applicants respectfully request that the § 103 rejection with respect to Claim 38, and its dependent claims, be withdrawn.

Independent Claim 40 recites a method, comprising:

receiving a first physical speaker signal;
generating first output signals for a first physical speaker;
generating second output signals for a second physical speaker
wherein the first and second output signals are generated from the
received first physical speaker signal; and
providing at least one of the first output signals and the second
output signals to at least one feedback crossover path operable to
receive, delay, and filter the at least one of the first output signals and
the second output signals, wherein generating the second output
signal comprises combining an output of the at least one feedback
crossover path and a first forward crossover signal received from a
first forward crossover path operable to receive, delay and filter a first
input signal.

The Applicants respectfully submit that *Schöne* does not teach or suggest the aforementioned features of Claim 40. In particular, it is submitted that *Schöne* does not teach or suggest “generating the second output signal comprises combining an output of the at least one feedback crossover path and a first crossover signal received from a first forward crossover path operable to receive delay and filter a first input signal.”

The Office Action argues that *Schöne* (B; left and right signals for speakers D) teaches generating first and second output signals for a first physical speaker and a second physical speaker. (*Office Action*, page 8). *Schöne* expressly teaches that a signal is transmitted by a “dummy head” (A); received by a sound pick-up side (B); a program signal is matched via a circuit arrangement (C); and output at speakers/headphones (D). (*Schöne*, col. 4, lines 19-27). Accordingly, *Schöne* teaches

that first output signal for the first physical speaker is the signal output from C4 and that the second output signal for the second physical speaker is output from C4. Neither of the signals output at C4 is generated by combining an output of the at least one feedback crossover path and a first forward crossover signal received from a first forward crossover path operable to receive, delay and filter a first input signal. Rather, both are generated by combining a forward signal to decoupled signals that have been output from an inverse filter coupled to the input. Neither signal is generated by combining outputs of the feedback and forward crossover signals.

Further, the signals output at C4 are generated based on two different input signals at A1. Accordingly, the signals output at C4 are not generated from the received first physical speaker signal. Therefore *Schöne* does not teach or suggest each and every feature recited in Claim 40.

Accordingly, the Applicants respectfully request that the § 103 rejection with respect to Claim 40, and its dependent claims, be withdrawn.

CONCLUSION

As a result of the foregoing, the Applicants assert that the remaining Claims in the Application are in condition for allowance, and respectfully request an early allowance of such Claims.

If any issues arise, or if the Examiner has any suggestions for expediting allowance of this Application, the Applicants respectfully invite the Examiner to contact the undersigned at the telephone number indicated below or at *wmunck@munckcarter.com*.

The Commissioner is hereby authorized to charge any additional fees (including any extension of time fees) connected with this communication or credit any overpayment to Deposit Account No. 50-0208.

Respectfully submitted,

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